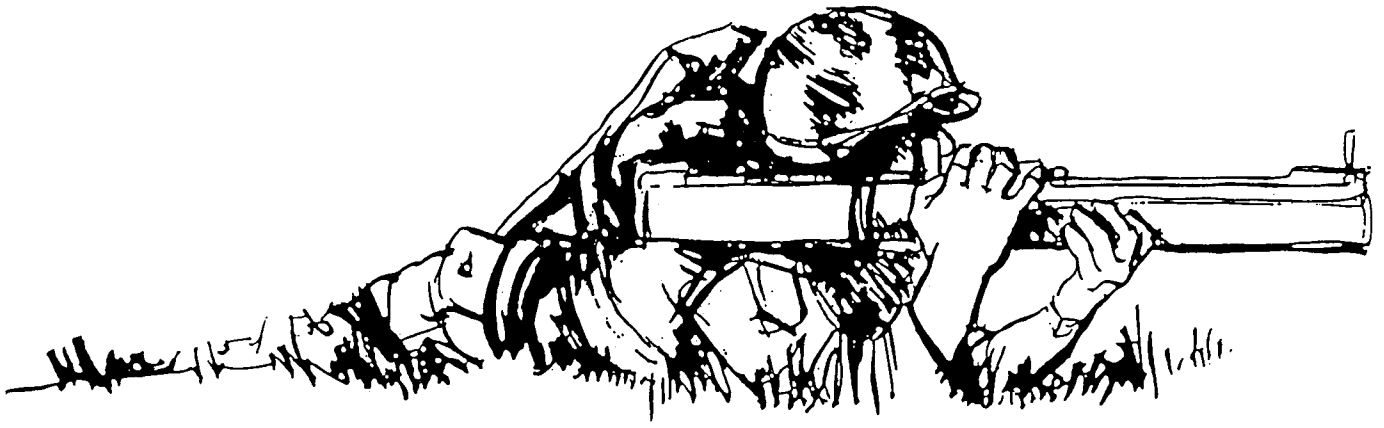

Tactical Employment of the Shoulder-Fired Rocket

New Tactics for the New LAW

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Infantry defensive operations in the past have demonstrated the effects of combining and integrating mortars and machineguns. A hail of machinegun fire mows down the advancing enemy infantry, slowing or even halting its advance. The enemy is forced to seek shelter and concentrate in areas that are dead space to the machineguns, where he is then hit with pre-planned mortar fire. Finally forced to move from under the mortar barrage, he is driven into the machineguns' kill zones. This is a fundamental, long-established, and successful concept of infantry doctrine.

Offensive operations, on the other hand, have shown surprisingly little effect from supporting indirect fires. The offensive counterpart to achieving such a devastating tactical effect is to team the attacking infantry with armor. The tanks can maintain the momentum, giving the infantrymen some protection from machinegun bullets and preventing them from becoming a concentrated and stationary mortar target. The massive direct fire from the tank gun keeps machinegun emplacements and rifle strong points from holding up the advance. As with the defensive tactic, the tank-infantry team is also a fundamental infantry concept and a cornerstone of combined arms doctrine.

The question arises as to the corollary for Marine, light infantry, airborne, air assault, and special operations forces engaged in small-unit operations with no significant armored threat or support. Operations other than war, or even regional conflicts in many parts of the world, do not involve major armor engagements or even heavy artillery. The vision of small units in ambiguous and fluid situations—engaging in brief, sharp firefights and supported by aerial fire support and calls for resupply—calls for light, organic, and tactically decisive direct-fire weapons. Proactive offensive operations—raids, ambushes, and assaults on strongholds in fortified or built-up areas, executed with surprise and shock—will be the key to resolving the issue with minimal casualties.

Historical analysis may offer evidence of another fundamental concept that has not yet been fully exploited in infantry doctrine to enhance the offensive capabilities of light forces. Consider the shock action achieved by the integration of massed shoulder-fired rockets with the squad automatic weapon. In World War II, the 2.36-inch bazooka was fielded in the weapons squad along with the medium machinegun. The bazooka functioned as a crew-served antitank and anti-machinegun bunker weapon. Its tactical evolution was in some ways limited by the basis of issue. Office of Strategic Services (OSS) operational teams behind the lines evolved tactics with the resistance groups in which they employed elements heavily equipped with squad automatic weapons—Browning automatic

rifles (BARs) or British Brens—and with large numbers of bazookas. This weapon concept, even with lightly equipped and poorly trained resistance fighters, brought devastating results in raids, ambushes, and attacks on isolated German and Japanese positions. The German Panzerfaust—combined with the MG-42 machinegun, MP-44 assault rifle, and MP-40 submachinegun in squad and platoon size elements—again showed extraordinary battlefield capability in close combat, delaying the overwhelming mass of U.S. and Soviet mechanized attacks in restrictive terrain.

The length and bulk of the U.S. bazooka launcher and the basis of issue hampered the development of this concept with U.S. infantry through World War II and the Korean war. Because of the limited number of bazookas available to soldiers and the cumbersome nature of the flame-thrower, eliminating machinegun bunkers during amphibious and jungle operations was a costly game of engaging the bunker openings with BARs and machineguns and then stalking close enough to throw a grenade inside. The inadequacy of the 2.36-inch bazooka against the later German tanks and the Russia T-34 tank in Korea drove the development of the 3.5-inch bazooka, and began the armor-versus-antiarmor development cycle that influenced infantry light antitank weapon programs through the 1980s.

In the early 1960s, the M72 LAW solved the major problems with the development of the shoulder-fired rocket as an infantry weapon.

In the early 1960s, the M72 LAW (light antitank weapon) solved the major problems with the development of the shoulder-fired rocket as an infantry weapon. Light and compact, it was issued as a round of ammunition rather than a crew-served weapon, which enabled the always overloaded infantrymen to carry a significant number. Thus, the employment of the shoulder-fired rocket as a general purpose weapon was more flexible, and it could be tailored to the mission and enemy situation.

Advances in armor, however, led to the over-specialization of the shoulder-fired rocket as a tank killer, and the failure of the Army's Viper program led to the eventual adoption of the Swedish AT4. The requirement to penetrate the frontal armor of the enemy main battle tank made the heavy antitank missiles and the M1 tank the focus of doctrine and weapon development. Even though the LAW was of marginal use in an AirLand Battle-style armored engagement, it was ideal for tank fighting in built-up areas, while the additional weight and bulk of the AT4 served to limit the number that could be carried to one per rifleman. Warhead and fuzing development focused entirely on the tank target. The sheer weight of the system established a limited basis of issue and therefore limited the development of tactics and techniques that would move the shoulder-fired rocket beyond tank killing and make it an integrated element of infantry close combat.

Fighting armor with such light weapons as the LAW is akin to facing a wooly mammoth with a stone-tipped spear. The hunter must realize that his weapon has limited penetration and will make only a very small hole in a very large and dangerous monster. The hunter must be able to visualize the location of all the beast's vital organs, in three dimensions, from all angles, and while it is moving. He must pick the spot that will allow the penetrator to reach a vital organ, strike quickly without exposing himself, and make sure he doesn't miss. The beast can be killed only by aiming to penetrate the heart, major blood vessels, the spine, or—in our case—the driver, gunner, engine, transmission, or ammunition and fuel storage. Hitting an armored vehicle anywhere else is like poking the mammoth with a sharp stick. Tank fighting, like mammoth hunting, is best done when you can blind, confuse, and channel the monster so a team of hunters can make a coordinated attack from the flanks and rear.

Since their development in World War II by the U.S. and Germany, shoulder-fired rockets have proved to be devastating weapons in the hands of both our enemies and our allies. A historical analysis of fire fights in Vietnam shows numerous incidents in which U.S. and Army of the Republic of Vietnam units came under attack in ambushes, meeting engagements, or attacks on base camps. In a scenario that was repeated over and over, units were pinned down under intense automatic weapons fire and subjected to intense assaults from rocket-propelled grenades (RPGs). The enemy not only engaged bunkers and machinegun positions but fired on individual foxholes, groups of soldiers, any concentration of organized resistance, vehicles, and even helicopters. This scenario was repeated in El Salvador and as recently as the Rangers' 1993 firefight in Mogadishu, where again troops under intense small-arms fire were subjected to a stream of incoming RPGs. The British used large numbers of M72 LAWs in the Falklands to blast their way into Argentinean fortifications. Once entry could be forced through the enemy bunker line, all resistance collapsed.

There are several important lessons from this historical analysis that still need to be learned and emphasized in doctrine. As both sides struggle to get the upper hand in the chaos of close combat, the first side to falter and break will pay the heaviest price. Exploiting opportunity and seizing the initiative depend upon timing and flexibility. In these situations, organic direct-fire weapon crews often fail to get on target rapidly and then don't fire enough rounds to have a decisive effect. Most of the casualties are inflicted in the first burst of fire; then the ratio of casualties to ammunition expended rapidly diminishes. Given the opportunity to initiate the engagement, always use the most powerful and responsive weapon at your disposal.

Advances in armor led to the over-specialization of the shoulder-fired rocket as a tank killer.

The M72 LAW's light weight and compact size allow each soldier to carry a significant number of rounds. The LAW is

short enough to be strapped horizontally across the top of the rucksack so that a soldier can parachute, rappel, or climb with three or four rounds. Employed in this manner, the LAWs are dispersed throughout the unit, making it more likely that the soldier who ends up in a position to make the critical shot will have the appropriate weapon. Its simple operation allows rapid engagements, even in awkward firing positions and confined spaces. At eight pounds, the new A-series LAW (M72A4, A5, or A6) weighs approximately half as much as the AT4 and has about one-third the bulk. The flat trajectory and short time of flight for these weapons increase the probability of a hit—despite range estimation errors, winds, or target movement—out to the operational range of 350 meters.

The LAW is most accurate when fired from a supported position. The new A-series trigger and a supported position eliminate the tendency to depress the weapon when pushing down on the trigger bar. Supporting the barrel with the shoulder and a forward support while maintaining gentle but firm downward pressure with the firing hand allows smooth tracking and prevents movement as the trigger bar is pressed. Firing from the prone position, supported over a sandbag, is extremely accurate but difficult in most scenarios. An alternative is to drop to the kneeling position (both knees), or a sitting position, and use the M16 or M4 as a shooting stick or monopod. Turn the rifle sideways and rest the LAW on the front sight support and against the barrel. If the rifle barrel is too hot to touch, loop the sling over the LAW to hold it in place. These three points of contact, with the weight of the firing hand pulling down against the shoulder and the forward support of the rifle, allows the firer to depress the trigger bar without moving the sights. Angling the rifle toward or away from the gunner adjusts elevation.

Firing at night can be supported with illumination rounds or hand-fired parachute flares; or, by the addition of the new sight bracket, an array of infrared lasers (AN/PAQ-4), night vision sights (AN/PVS-4), or even the thermal weapons sight can be attached and boresighted for non-illuminated attacks.

The enhanced warheads of the A-series provide AT4-class armor penetration with 350mm for the M72A4 and 300mm for the M72A5. The M72A6 is an ideal general-purpose weapon, with its penetration of 150mm of armor for lightly armored vehicles such as armored cars, BTRs, BMPs, and—as in Somalia—"technical vehicles" with enhanced target destruction. The M72A6 uses an explosively formed penetrator instead of a tightly focused shaped charge. This reduces the thickness of armor penetration but makes a much larger hole, with more spall and larger fragments for increased damage behind the wall or inside the armored vehicle. While all three M72 warheads are designed to protect the gunner by reducing the number of fragments projected toward the rear, they have an unappreciated casualty-producing effect to the sides. Firing LAWs into enemy positions or through openings, instead of against the outsides of structures, produces a significant blast effect. Detonating the .75-pound Octol/PBXN9 warhead explosive charge generates a lethal fragment radius of approximately nine meters to the sides, in addition to the shaped charge jet and the fragments directed forward. The new warheads combined with volley firing provide a devastating and decisive organic direct-fire capability.

Tank fighting, like wooly mammoth hunting, is best done when you can blind, confuse, and channel the monster as a team of hunters can make a coordinated attack from the flanks and rear.

The LAW is ideal for several more specialized tactics and techniques in special situations. Rocket raids, ambushes, stand-off, and remotely initiated attacks enhance battlefield capability through the innovative techniques of employing a standard weapon.

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The typical squad or platoon size raid establishes security positions to isolate the objective, sites the machineguns on the flank, and has the assault force infiltrate as close as possible. The machinegun opens up to initiate the raid, distributing fire over the objective to suppress the target until this fire is masked by the assault element. Commanders should consider having the assault element take one machinegun while the supporting guns remain in position or displace forward to defend the objective, depending on the tactical situation.

The rocket raid applies the concept of overwhelming direct fire. Once the security elements have isolated the objective, the assault element stalks as close as possible and initiates the attack by volley firing LAWs into the target. Volley fire was established originally to increase the probability of kill against a single tank; two or three soldiers would engage the same tank at once or in series. Their individual estimations of range and lead would ensure one or two hits, and with multiple hits achieve a reasonable kill probability.

In the rocket raid, each soldier not equipped with a machinegun fires at least one LAW into the objective. Critical targets or threats—including machinegun emplacements, command or observation posts, combat vehicles, or mission targets such as radar or communication vans, missiles, and parked aircraft—are assigned three LAWs. Bunkers or fighting positions at the point of attack are assigned two LAWs and all other significant targets one each. The simultaneous firing of ten to 20 LAWs into the objective provides the shock, confusion, and destruction to open the way for the assault force to bound forward using its machineguns in the assault and additional LAWs to overwhelm any remaining pockets of resistance.

With its extended range and accuracy, the new LAW is capable of a stand-off attack of the raid target. If the mission of the raid is to destroy bulk fuel or ammunition dumps, parked aircraft, missiles, communication, intelligence, or radar systems, a stand-off attack of volley firing LAWs offers several

advantages. The patrol can attack from outside such protective measures as barbed wire, observation posts, dog patrols, minefields, and the range of low-quality night-vision equipment. These targets are large, and gunners using steady supported firing positions have a high probability of hit that is further enhanced by having three gunners assigned to a critical target.

Indirect LAW fire can attack area targets such as airfields, bulk ammunition, or fuel sites, and harass or deceive positions. The tubes are extended and propped up with crossed sticks or sandbags and sighted along the tube for line-of-sight to the target or on a compass bearing. The elevation is set with a gunner's quadrant or the incline scale on an M2 compass if mils are used, or a simple protractor with a string and weight attached as an expedient quadrant if degrees are used to achieve the required range.

Elevations in mils and degrees are shown in the accompanying table; elevations can be extrapolated for ranges between the values given. If the target is below the launch site, subtract one-half the difference in altitude from the range, and if above, add one-half the difference in altitude to the range. A rough wind correction can be added by multiplying the wind speed in meters per second by the time of flight and adding that to the range of head winds, subtracting for tail winds, offset aiming upwind for crosswinds. This table is used to calculate a crosswind correction in mils by multiplying the wind speed in knots by the wind correction factor for the range and adding or subtracting the result to target bearing.

Another soldier can elevate the weapon using the quadrant while the gunner handles direction and firing, or the LAWs can be sandbagged in firing position and rigged for command firing and command initiated or connected to a timer.

The rocket ambush follows a similar concept with the entire assault force volley firing LAWs into the kill zone to initiate the ambush instead of using the conventional burst of machinegun fire. This technique is particularly useful in a hasty ambush where the preparation time is limited and the enemy situation is not fully known. When the ambush includes prior knowledge and channeling of enemy movement, the LAW can be effectively employed as an expedient remotely activated off-route mine. The LAW is extended and sandbagged into a concealed position to fire down or angling across the road, aligned about one meter above the road, opposite an identifiable aiming point. An electric blasting cap is taped to the trigger with the closed end of the cap to the front of the trigger bar. Several weapons can be connected in series using electric caps. The end of a strand of detonation cord can be used in place of the cap. Care must be taken to keep the cord away from the launch tube or to protect it with sandbags to prevent damage to or collapse of the tube from firing the cap or detonation cord. The LAWs are then command-fired when a vehicle is in line with the aiming point. Combined with claymore mines, a devastating mechanical ambush can be emplaced and fired by remote command, allowing a small force to engage a far superior force with minimum risk and then assault or withdraw in the ensuing confusion.

Employed as an expedient off-route mine, the LAW can be concealed on the side of a road or trail, placed overhead in trees, through loopholes in buildings, or on roofs and sighted to fire down into the center of the road. A field-expedient clothespin or double-loop switch is connected to a trip wire strung high enough to avoid detection but low enough to catch the tops of vehicles or their antennas. A battery and electric cap taped to the trigger bar complete the system. A standard pull booby-trap device with a non-electric cap can be attached to the LAW with the cap on the trigger bar and the trip wire run through a hole in the front sight. The LAW is secured to fire down the trip wire like a swivel gun.

Indirect LAW fire can attack area targets such as airfields, bulk ammunition or fuel sites, and harass or deceive positions.

The new LAW offers a significant increase in firepower for light forces.

Any number of pressure, pull, magnetic, or motion type sensors or timers can be connected with electric or non-electric firing systems to fire one or more LAWs. The gunner must remember to pick the point where the LAW is to hit, aim and secure the LAW in place, rig the firing system, check and camouflage everything, withdraw extra personnel, arm the LAW, and arm the firing circuit. The gunner should submit a hasty minefield report and, if possible, include a self-destruct timer, such as the M147 time-delay firing device, in the system to limit the risk of fratricide when the situation does not allow the disarming and recovery of the weapons.

The new LAW—the latest in lightweight high-tech weapons—offers a significant increase in firepower for light forces. It is a classic example of what can be achieved by the evolution of a proven weapon system through a product improvement program that focuses on the basics—such as range, accuracy, and lethality—without the problems of increased weight, cost, training, maintenance, and lower reliability associated with most new high-tech weapon developments. Innovative tactics and techniques are needed to exploit new equipment capabilities, and these can enhance the battlefield capability of our most versatile combat system—the light fighters.

Lieutenant Colonel Michael R. Harris, U.S. Army, retired, served in operational units in Panama and Fort Bragg and in combat development activities at Fort Benning, Fort Lewis, and Fort Bragg. During Operation *Desert Storm,* he was assigned to Special Operations Command Central in Kuwait. He also served in the U.S. Special Operations Command. He holds a master's degree from the Florida Institute of Technology.